



Attorney Docket No. 0756-2328

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

Hisashi OHTANI et al.

Serial No. 09/908,727

Filed: July 20, 2001

For: SEMICONDUCTOR DEVICE AND  
METHOD OF MANUFACTURING  
THE SAME

) Group Art Unit: 2812

) Examiner: R. Booth

) CERTIFICATE OF MAILING  
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P.O. Box 1450, Alexandria, VA 22313-1450, on  
April 26, 2004.

) Adam M. Stamer

RESPONSE

Honorable Commissioner of Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

The Official Action mailed December 24, 2003, has been received and its contents carefully noted. Filed concurrently herewith is a *Request for One Month Extension of Time*, which extends the shortened statutory period for response to April 24, 2004. Accordingly, the Applicants respectfully submit that this response is being timely filed.

The Applicants note with appreciation the consideration of the Information Disclosure Statements filed on July 20, 2001, August 27, 2001, February 19, 2002, September 20, 2002, and April 17, 2003. With respect to the copy of sheet 1 of 2 of the IDS filed on July 20, 2001, considered by the Examiner on June 25, 2003, and attached to the Official Action mailed June 30, 2003, the Examiner's initials ("RB") appear next to U.S. Patent No. 4,986,213 to Yamazaki et al. and U.S. Patent No. 6,096,581 to Zhang et al. Although a line was not drawn between the Examiner's initials, it is understood by the Applicants that the Examiner has considered all of the references cited on sheet 1 of 2 of the IDS filed on July 20, 2001.

Claims 1-56 are pending in the present application, of which claims 1-24 are independent. For the reasons set forth in detail below, all claims are believed to be in condition for allowance. Favorable reconsideration is requested.

The Official Action rejects claims 1-6, 13-20, 25-27 and 30-32 as anticipated by U.S. Patent No. 5,529,937 to Zhang et al. The Applicants respectfully traverse the rejection because the Official Action has not established an anticipation rejection:

As stated in MPEP § 2131, to establish an anticipation rejection, each and every element as set forth in the claim must be described either expressly or inherently in a single prior art reference. Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

The Applicants respectfully submit that an anticipation rejection cannot be maintained against the independent claims of the present invention. Zhang does not teach all the elements of the independent claims, either explicitly or inherently. Zhang does not teach that a surface of a semiconductor film is leveled by heating after removing an oxide film (e.g., claim 1), either explicitly or inherently. The Official Action asserts that Zhang teaches the above-referenced features and cites column 17, lines 17-21 to support this assertion (pages 2 and 6, Paper No. 1203). The Applicants respectfully disagree and traverse the above assertion.

Zhang, at column 17, lines 17-21, merely teaches "that dangling bonds caused in the process of annealing by visible or near infrared radiation are neutralized by heating the substrate." The Applicants respectfully submit that this teaching in Zhang is not concerned with leveling a surface of a semiconductor film by heating after removing an oxide film. Rather, Zhang teaches "when visible or near infrared radiation, or laser light are irradiated, [a] protective film of silicon oxide or silicon nitride is formed on the surface of active layers and therefore roughness or contamination on the surface caused by irradiation of infrared radiation or laser light can be prevented (FIG. 3(C))" (column 13, lines 58-61). That is, Zhang appears to use a protective film in order to prevent roughness on a surface of active layers and does not appear to be concerned

with leveling by heating. Therefore, Zhang does not teach that a surface of a semiconductor film is leveled by heating after removing an oxide film, either explicitly or inherently.

Since Zhang does not teach all the elements of the independent claims, either explicitly or inherently, an anticipation rejection cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 102 are in order and respectfully requested.

The Official Action rejects claims 21-24 and 53-56 as obvious based on the combination of Zhang and U.S. Patent No. 5,891,764 to Ishihara et al., claims 7-12, 28, 29 and 39-44 as obvious based on the combination of Zhang and Wolf et al., "Silicon Processing for the VLSI Era: Volume 1: Process Technology," pages 198, 532-533, Lattice Press, 1986, and claims 33-38 and 45-52 as obvious based on Zhang.

Please incorporate the arguments above with respect to the deficiencies in Zhang. As noted above, Zhang appears to use a protective film in order to prevent roughness on a surface of active layers and does not appear to be concerned with leveling by heating. The Applicants respectfully submit that the Official Action has not presented a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the cited prior art references. Specifically, it is unclear why one of ordinary skill in the art would have been motivated to modify Zhang so as to remove the protective film described in column 13, lines 58-61, and add a leveling step by heating. Even if one were motivated to remove the protective film, it is not clear that the step of heating after annealing described in column 17, lines 17-21, teaches or suggests leveling a surface of a semiconductor film by heating after removing an oxide film. Therefore, Zhang does not teach or suggest leveling a surface of a semiconductor film by heating after removing an oxide film.

Ishihara and Wolf do not cure the deficiencies in Zhang. The Official Action relies on Ishihara to allegedly teach "a rectangle shaped laser beam" (page 3, Paper

No. 1203) and on Wolf to allegedly teach that "it is common to remove silicon oxide using hydrofluoric acid" (page 4, Id.). Zhang, Ishihara and Wolf, either alone or in combination, do not teach or suggest leveling a surface of a semiconductor film by heating after removing an oxide film.

Since Zhang, Ishihara and Wolf do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) are in order and respectfully requested.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,

  
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# TRANSMITTAL FORM

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## ENCLOSURES (check all that apply)

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## SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	Eric J. Robinson, Reg. No. 38,285 Robinson Intellectual Property Law Office, P.C. PMB 955 21010 Southbank Street Potomac Falls, VA 20165
Signature	
Date	April 26, 2004

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